CLAIMS

What is claimed is:

1. An implantable article comprising:

an implant for a mammal having a biologically compatible surface, a portion of said surface silylated with organosilanes; and

one or more of said organosilane bonded to therapeutic molecules; said therapeutic molecule interacting with cells adjacent to the surface of said implant.

2. The implantable article of claim 1 including an acid-labile or enzyme-labile bond, said therapeutic molecule released from said organosilane by interacting with said cells.

3. The implantable article of claim 1 wherein the therapeutic molecule is chosen from the group consisting of peptide, therapeutic oligonucleotides, antibiotics, cell growth factors, chemotherapeutics, thrombolytic, anti-inflammatories, and osteoactive factors.

4. The implantable article of claim 1 wherein the therapeutic molecule is bonded to said organosilane through a peptide including an RGD (SEQ ID NO: 1) sequence.

5. The implantable article of claim 1 wherein said therapeutic molecule is covalently bonded to said organosilane.

6. The implantable article of claim 1 wherein the therapeutic molecule interacts with said cells to alter angiogenesis, or decrease bacterial proliferation adjacent to said implant.

7. The implantable article of claim 1 wherein the therapeutic molecule is covalently bonded to the implant surface treated with an organosilane.

8. The implantable article of claim 1 wherein said therapeutic molecules are cleaved from said organosilane by intracellular enzymes or acid.

9. The implantable article of claim 1 wherein said therapeutic molecules are exchanged with endogenous ligands of the cell.

10. An implantable article comprising:

an implant for a mammal having a biologically compatible surface, a portion of said surface silylated with organosilanes;

one or more of said organosilanes covalently bonded to the terminus of a linking group; and

one or more of said liking groups bonded to therapeutic molecules; said therapeutic molecule interacting with cells adjacent to the surface of said implant.

11. The implantable article of claim 10 wherein said therapeutic molecule enters the membrane of said cells or passes through the wall of said cells.

12. The implantable article of claim 10 wherein the therapeutic molecule is chosen from the group consisting of peptide, therapeutic oligonucleotides, antibiotics, cell growth factors, chemotherapeutics, thrombolytic, anti-inflammatories, and osteoactive factors.

13. The implantable article of claim 10 wherein said linker includes a peptide.

14. The implantable article of claim 13 wherein labilization of the therapeutic molecule from the linker leaves a peptide covalently bonded to the surface that promotes the adhesion and maturation of cells.

15. The implantable article of claim 10, where the linker includes oligo(ethylene glycol).

16. The implantable article of claim 10 wherein the implant includes titanium.

17. The implantable article of claim 10 wherein said linker includes an acid or enzyme labile bond, said therapeutic molecule released from said linker by interacting with said cells.

18. The implantable article of claim 10 wherein the therapeutic molecule is bonded to said organosilane through a peptide including an RGD (SEQ ID NO: 1) sequence..

19. The implantable article of claim 10 wherein said therapeutic molecule is covalently bonded to said organosilane.

20. The implantable article of claim 10 wherein the therapeutic molecule interacts with said cells to alter angiogenesis, or decrease bacterial proliferation adjacent to said implant.

21. The implantable article of claim 10 wherein said therapeutic molecules are cleaved from said linker by intracellular enzymes or acid.

22. The implantable article of claim 10 wherein said therapeutic molecules are exchanged with endogenous ligands of the cell.

23. The implantable article of claim 10 wherein said linker includes acid labile linkers chosen from the group consisting of methylmaleamide, hydrazone, and combinations thereof.

24. An implantable article comprising:

the terminus of one or more linking groups covalently bonded to a silylated implant surface, the opposite terminus of one or more of said linking groups bonded to an antibiotic; said antibiotic interacting with cells adjacent to the surface of said implant.

25. The implantable article of claim 24 wherein the linking group bonded to the implant surface includes an integrin binding peptide sequence.

26. The implant article of claim 24 wherein the implant surface includes titanium.

27. The implant article of claim 24 wherein the linkage includes an acid-labile or enzyme-labile bond.

28. The implantable article of claim 24 wherein labilization of the antibiotic molecule from the linker provides a peptide that promotes the adhesion and maturation of bone cells.

29. The implantable article of claim 24 wherein the antibiotic includes those chosen from the group consisting of minocyclins, tigecyclin, glycylcycline, vancomycin and its analogs, rifampin and its analogs, gentamycin and its analogs, or combinations thereof.

30. The implantable article of claim 24 wherein the linker promotes osseointegration.

31. The implantable article of claim 24 wherein the antibiotic is competitively bonded to said linker.

32. A method of treating a mammal comprising:

    inserting an implant into a site in need thereof on said mammal, said implant having a biologically compatible surface silylated with organosilanes and wherein one or more of said organosilanes is bonded to therapeutic molecules; said therapeutic molecule interacting with cells adjacent to the surface of said implant in said mammal.

33. The method of claim 32 wherein said therapeutic molecules include antibiotics.

34. The method of claim 32 wherein said implant is used for fracture fixation.

35. The method of claim 32 wherein the implant promotes osseointegration.

36. The method of claim 32 wherein the therapeutic molecule prevents bacterial proliferation.

37. The method of claim 32 wherein said therapeutic molecule is released from said linker by reaction with a cellularly derived acid, an enzyme, or ligand.

38. The method of claim 32 wherein said implant alters the proliferation of cells at the site of said implant.